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Basic life support: Knowledge and attitude among dental students and Staff in the College of Dentistry, King Saud University



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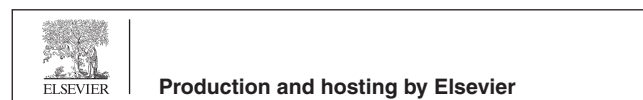
Abstract *Objective:* To assess and compare the level of knowledge and attitude toward basic life support among bachelor of dental surgery clinical students (third-, fourth-, and fifth-year dental students), dental interns, postgraduate students and faculty in the Dental College at King Saud University, Riyadh, Saudi Arabia. *Material and methods:* A previously validated self-select questionnaire was randomly distributed to the participants. The structured questionnaires consist of demographic data, knowledge and attitude of the participants related to basic life support. *Results:* 454 participants completed the surveys with response rate of 77.85%. The mean knowledge score for the participants was 5.99 with a median score of six. A highly statistically significant difference was detected among the different academic groups (analysis of variance ANOVA; $F = 9.756$, $P < 0.001$). The mean scores of the third-year students were significantly the highest, while fifth-year students showed the lowest knowledge score. The majority of the participants (93.6%) thought that dentists and dental students should know about basic life support and that it should be included in the undergraduate dental curriculum. *Conclusion:* Our findings demonstrate that dental students and staff had inadequate basic life support knowledge. However, they had positive attitudes toward it.

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1. Introduction

Basic Life Support (BLS) is a simple life-saving protocol following a cardiac arrest. It is an integral part of emergency resuscitative care that aims to retain sufficient ventilation and circulation until the cause of the arrest is detected and eliminated.¹ As health care professionals, dental practitioners encounter life-threatening medical emergencies. A study by Müller et al.² found that medical emergencies are not rare in

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dental practice, as about two-thirds of dentists faced at least one emergency during the 12-month study period. In the context of medical emergencies, provision of a competent BLS carries a potential impact on lives. It is recommended that all medical students and staff, who are exposed to patients, must be trained to offer basic life support.³ It has been reported that knowledge and practice of BLS increase the survival of patients after cardiac arrest.⁴

Different reports have described the knowledge of BLS among health care professionals.^{5–7} However, there has been little research regarding the knowledge and attitude of BLS in the dental profession.^{8–10} Chandrasekaran et al.⁹ evaluated the knowledge of BLS among healthcare students and professionals and found that the study subjects were severely lacking in BLS knowledge. Reddy et al.¹⁰ assessed the knowledge of BLS among bachelor of dental surgery clinical students, dental interns, postgraduate students, and dental faculty in a dental school in India. The study concluded that postgraduate students and faculty had significantly poorer knowledge when compared to undergraduate students and dental interns. A study by Gonzaga et al.⁸ found that 86% of the interviewed dentists had received information about CPR; however, most of them had not received practical training for cardiopulmonary resuscitation. The aforementioned literature highlights the lack of BLS knowledge among dental students and teaching staff in dental schools.

In Saudi Arabia, the literature is limited in regard to the BLS knowledge among health care professionals. Recently, Almesned et al.¹¹ reviewed the BLS knowledge among healthcare students, physicians and pharmacists at Qassim University in Saudi Arabia, and found that the knowledge of the participants was poor and mandates improvement. The study participants included 93 medical students, 7 medical interns, 6 dental students, 7 pharmacy students, 11 medical science students, 4 general physicians, and 11 pharmacists. Another study¹² showed poor awareness about the BLS among students of college of applied medical sciences and college of medicine at King Saud Bin Abdulaziz University of Health Sciences in Saudi Arabia. Nevertheless, there is no detailed information regarding BLS knowledge and attitude among dental students and staff in dental schools in Saudi Arabia.

The aim of the present study is to assess and compare the level of knowledge and attitudes toward BLS among bachelor of dental clinical students, dental interns, dental residents, and staff in the College of Dentistry at King Saud University, Riyadh, Saudi Arabia.

2. Material and methods

This cross-sectional, survey-based study enrolled third-, fourth-, and fifth-year dental students, dental interns and general practitioners. It also enrolled postgraduate students and dental faculty members in the College of Dentistry, King Saud University, Riyadh, Saudi Arabia. The questionnaire is previously validated⁶ by piloting in other hospitals and the appropriate changes have been made before it was finalized for the study. It was randomly distributed among the participants along with a covering letter that describes the project. The questionnaire was piloted again and reviewed by an expert. The study protocol was reviewed and approved by

College of Dentistry Research Center, King Saud University, Riyadh, KSA (IR 0113). It was conducted in accordance with the ethical principles for medical research involving human subjects of the Helsinki Declaration. The questionnaires were self-administered, where participants are supposed to fill out them with adequate time. Confidentiality was maintained through the process.

The structured questionnaires consist of three major sections:

1. Demographic data and professional qualification: (gender, academic level, duration of clinical experience and any previous exposure to BLS course).
2. Knowledge of participants related to BLS (15 MCQs with 5 options).
3. Attitude toward BLS (5 close-ended questions).

The knowledge score for each participant was calculated with a maximum possible score of 15 and minimum score of 0, where a higher score indicates a greater knowledge. Statistical Package for Social Sciences software (SPSS version 22.0) was used for data analysis. A critical *P* value of 0.05 was regarded as significant.

3. Results

We distributed 596 questioners to the participants of our interest. Four hundred and sixty four were returned, with a response rate of 77.85%. We excluded 10 incomplete surveys. Out of the 454 participants 220 (48.5%) were males, and 234 (51.5%) were females.

The sample consisted of seven groups according to the different academic levels (Table 1). The duration of clinical experience was divided into; less than 5 years, 5–10 years, and more than 10 years representing the following percentages; (76%), (13.4%), and (10.6%) respectively. Almost all the participants (99.1%) had attended previous BLS workshops, with the majority (89.9%) being within the last 5 years. Most of the participants (86.8%) had not been involved in any patient resuscitation experience.

As shown in (Table 2), most (93.6%) of the participants thought that dentists and dental students should know about BLS and it should be included in the undergraduate dental curriculum. A large number of the respondents (63.2%) were reluctant to perform CPR to a stranger. About one third of them (33.3%) indicated that the reason for reluctance is being afraid of causing harm to the patient. The reluctance to perform CPR significantly differed by gender ($X^2 = 16.606$, $df = 1$, $P < 0.001$). Males were more likely to show reluctance than were the females. Concerning the reasons for lack of BLS knowledge, almost half of the respondents (48%) chose the busy curriculum. Further reasons include no available professional training and the lack of interest. Some participants offered other written reasons, which revolve around the belief that medical emergencies are not commonly encountered, incomprehension of the importance of BLS, and the need for regular update of BLS knowledge of dentists.

The number and percentage of knowledge score of the participants are listed in (Table 1). The mean score for the participants was 5.99 with a median score of six. The knowledge score was significantly higher among females when compared

Table 1 Comparisons of the knowledge score in relation to the different characteristics of the participants.

Variable	Number	Minimal score	Maximum score	Mean score	SD	<i>P</i> value [†]
<i>Gender</i>						
Male	220	1	14	5.74	2.319	0.025
Female	234	0	12	6.22	2.208	
<i>Academic level</i>						
3 rd year dental students	90	1	14	7.20	2.695	< 0.001
4 th year dental students	85	1	10	5.59	1.860	
5 th year dental students	73	3	9	4.74	1.424	
Dental interns and GP*	82	0	10	6.02	2.061	
Dental residents [†]	39	1	11	6.08	2.464	
Lecturers	37	2	10	5.70	1.913	
Faculty [‡]	48	1	12	6.40	2.439	
<i>Clinical experience</i>						
Less than 5 years	345	0	14	5.98	2.257	0.594
Between 5 and 10 years	61	1	11	5.80	2.104	
More than 10 years	48	1	12	6.25	2.597	
<i>The last attended BLS[#] workshop</i>						
within the last 5 years	408	0	14	6.04	2.251	0.392
more than 5 years ago	32	2	11	5.69	2.264	
<i>Done/seen BLS (CPR)** done on a patient</i>						
Yes	59	1	13	5.90	2.324	0.761
No	394	0	14	5.99	2.268	
<i>Reluctance to perform resuscitation</i>						
Yes	287	0	11	5.68	2.084	< 0.001
No	167	1	14	6.51	2.486	

* General practitioner.

† Demonstrators and postgraduate dental students.

‡ Assistant professor, associate professor, and professors.

BLS; basic life support.

** CPR; cardiopulmonary resuscitation.

† *p* < 0.05, *t*-test or one way ANOVA test, as appropriate.

to males. A highly statistically significant difference was detected among the seven academic groups (ANOVA; $F = 9.756$, $P < 0.001$). Post hoc comparisons using Tukey HSD test indicated that the mean scores of the third year students were significantly higher than fourth year, fifth year students, interns and general practitioner (GP), and lecturers. Fifth year students had significant lower scores compared to interns and GP, dental residents, and faculty. Those who were not reluctant to perform CPR to a stranger had higher knowledge scores. The participants with more than 10 years clinical experience had higher knowledge scores in comparison to the less experienced ones, but this difference was not of statistical significance. The involvement in resuscitation experience was insignificantly related to the level of BLS knowledge.

As shown in Table 3, a large number of participants knew the abbreviation of BLS. Half of the respondents were able to answer the questions about the meaning of “no signs of life” and “What is the next step of BLS when you encounter an unresponsive victim?”. Less than one third of the participants were able to answer the question about the management of an unconscious and not breathing victim and the question about the best option of resuscitation if not willing to perform mouth-to-mouth ventilation. When asked about the recommended maneuver for opening the airway of the injured victim, only 26% of them pointed out that the head tilt-chin lift

maneuver should be avoided in suspected victims with C-spine injury.

As for the questions on chest compression in adults, more than half of the participants were able to identify that the right location of the hands for chest compression is the center of the chest. In addition, almost half of the participants identified the correct chest compression to ventilation ratio, rate and depth of chest compression. About 74% of the respondents failed to identify the right rescue breathing technique for infants and the right compression to ventilation ratio in newborns. Nevertheless, 37.4% of them knew that the depth of chest compression in an infant is one half to one third of the chest. The identification of the right way to manage a choking pediatric patient was identified by 38%. However, less than one third of the respondents were able to identify the correct way to manage a choking adult.

4. Discussion

In the present study, we found that the dental students and staff had inadequate BLS knowledge. To the best of our knowledge, this is the first study in Saudi Arabia that addresses the detailed knowledge and attitudes of BLS in a dental school. Our findings are in accordance with previous studies that

Table 2 Opinions of participants toward Basic life support.

Opinion	Number	Percentage
<i>All dental students and staff need to know about BLS*</i>		
Yes	425	93.6
No	28	6.2
<i>BLS training should be part of the dental curriculum</i>		
Yes	425	93.6
No	27	5.9
<i>Reluctance to perform resuscitation</i>		
Not reluctant	167	36.8
Reluctant	287	63.2
<i>Reasons for reluctance</i>		
Fear of causing further harm to patient	151	33.3
Fear of acquiring infection	51	11.2
Fear of taking responsibilities	51	11.2
Not confident	59	13.0
<i>The reason for lack of knowledge about BLS</i>		
Busy curriculum	218	48.0
Lack of interest	77	17.0
No professional training available	168	37.0
The need for regular update of BLS knowledge of dentists	11	2.4
Incomprehension of the importance of BLS	6	1.3
Medical emergencies are not commonly encountered	8	1.8
Other causes	5	1.1

* BLS; basic life support.

found similar results and concluded that awareness and knowledge of BLS need to be improved and updated.^{6,9,10} This study demonstrated that third-year students had the highest knowledge mean score, whereas fifth-year students had the lowest one. This result supports the finding of Reddy et al.,¹⁰ which concluded that a greater percentage of third-year students have adequate knowledge (91.5%). This was attributed to the fact that the third-year students had attended general medicine clinics and a CPR course within the previous three months. Cooper et al.¹³ found that there was a significant improvement in knowledge and skills of the participants who had taken a BLS course within the previous six months. This finding highlights the need for continuous improvement of BLS skills and knowledge.

Most of the participants thought that dentists and dental students should know about BLS and that it should be included in the undergraduate dental curriculum. Pillow et al.⁷ found that 98.2% of students believed that BLS should be included in the medical student curriculum. Roshana et al.⁶ found that 95% of student respondents thought that BLS should be included in the undergraduate curriculum. A study done by Sharma and Attar¹⁴ concluded that all participating interns (100%) from medical and dental streams favored inclusion of BLS in their academic curriculum, thus stressing the need for structured BLS training. Moreover, Zaheer and Haque¹⁵ showed that a large number of participants (79%) were of the opinion that training of BLS should be a part of the undergraduate curriculum.

In this study, one question (related to the abbreviation of BLS) was correctly answered by 92.1% of the participants,

whereas 14 questions were correctly answered by about half of the participants. These results are similar to those obtained by Roshana et al.⁶, who found that one question (related to the abbreviation of CPR) was correctly answered by 96.7% of the participants, whereas the rest of the questions were correctly answered by less than 50% of the participants.

We found that almost two-thirds of the participants were reluctant to perform resuscitation. In contrast, Roshana et al.⁶ found that only 17.4% were reluctant to perform resuscitation. A study by Laurent et al.⁵ found that final-year dental students expressed themselves as skilled at performing CPR however; they were not capable of competently managing a cardiac arrest. In the present study, the most common cause of reluctance was the fear of further harm to the victim followed by the fear of being ineffective and the fear of taking responsibilities. Roshana et al.⁶ found that the most commonly cited anxiety for the performance of resuscitation was the fear of being ineffective followed by the fear of further harm to the victim. These fears, in addition to poor knowledge and lack of

Table 3 Basic life support knowledge of the participants.

Question	Correct n(%)	Incorrect n(%)	I don't know n(%)
What is the abbreviation of BLS*?	418(92.1)	29(6.4)	7(1.5)
What does 'No signs of life' mean?	231(50.9)	205(45.2)	18(4.0)
What is the next step of BLS when you encounter an unresponsive victim?	237(52.2)	173(38.1)	44(9.7)
Maintaining an open airway for an unconscious patient with a spinal injury.	118(26)	239(52.6)	97(21.4)
A person, who is unconscious, not breathing, has a weak pulse, needs?	101(22.2)	272(59.9)	81(17.8)
Option of resuscitation if you do not want to give mouth-to-mouth CPR†	133(29.3)	267(58.8)	54(11.9)
What is the location for chest compression in adults?	290(63.9)	133(29.3)	31(6.8)
Rate of chest compression in adults and children during CPR.	196(43.2)	163(35.9)	95(20.9)
Depth of compression in adults during CPR.	211(46.5)	130(28.6)	113(24.9)
Ratio of CPR, single rescuer in adults is?	215(47.4)	157(34.6)	82(18.1)
How do you give rescue breathing in infants?	117(25.8)	197(43.4)	140(30.8)
In a newborn the chest compression and ventilation ratio is.	25(5.5)	327(72)	102(22.5)
Depth of compression in children during CPR?	170(37.4)	147(32.4)	137(30.2)
Management of choking adult	82(18.1)	284(62.6)	88(19.4)
Management of choking infant	174(38.3)	165(36.3)	115(25.3)

* BLS; basic life support.

† CPR; cardiopulmonary resuscitation.

training, explain why most of the participants were reluctant to perform CPR.

Interestingly, this study showed that three factors might have an effect on the knowledge scores of the respondents, which were, gender, years of clinical experience, and level of reluctance. The knowledge score was significantly higher among females when compared to males. This finding is similar to that reported by Reddy et al.¹⁰, which concluded that when mean knowledge scores were compared, females had higher mean scores as compared to males. The participants with more than 10 years clinical experience had higher knowledge scores in comparison to the less experienced ones, but this difference was not of statistical significance. This finding can be explained by the notion that longer clinical experience increases the likelihood of participants being involved with medical emergencies; these previous experiences likely impact the retention of knowledge. However, Roshana et al.⁶ found that there was no association between the knowledge scores of the participants and the duration of their clinical work. Those who were not reluctant to perform CPR to a stranger had higher knowledge scores. This can be attributed to the fact that the readiness of health care providers to perform BLS is enhanced when their knowledge level is high. On the other hand, Roshana et al.⁶ found that most participants were not reluctant to perform CPR despite their lack of knowledge.

The most common justifications indicated by the participants for their lack of knowledge and skills were busy curriculum followed by no professional training available. Arsati et al.¹⁶ found that the lack of training and updates in an undergraduate program was the common cause for the lack of the knowledge. Almost all of our participants expressed the need for improved knowledge of BLS and agreed that it should be included in the undergraduate dental curriculum. Stafuzza et al.¹⁷ found that BLS training is fundamental to health care professionals.

Although uncommon, medical emergencies can occur in dental practice. Müller et al.² found that medical emergencies are not rare in dental practice, although most are not life threatening. However, our results showed that the participants were not competent enough to deal with emergencies.

Gonzaga et al.⁸ found that theoretical information without practical training is not enough to assure CPR competence. Practical assessment is difficult to be performed through a questionnaire. Practical skills could not be assessed in the present study however; we focused on the cognitive levels of BLS. Other limitations of the study need to be acknowledged. The study was conducted at a single dental college. Therefore, generalizing the results is not plausible. Moreover, the inherent limitations present in the cross sectional and self-reported survey-based research should be considered. We recommend that future research address the assessment of practical skills required for BLS. Moreover, we recommend evaluating the BLS knowledge among other dental institutes and hospitals. This study would help in future development of training courses about BLS within the academic curricula and in adopting guidelines in this regard in dental schools.

5. Conclusion

Taken together, our findings demonstrate that dental students and staff had inadequate BLS knowledge. However, they had

positive attitudes toward it. Dentistry is a health profession that should provide complete medical care and treat the whole patient rather than focusing on the oral cavity. We believe that undergraduate courses in dentistry must be revised to insure proper BLS training. Similarly, after graduation, the dentist should regularly take theoretical and practical courses.

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Ethical approval

The study received approval from the College of Dentistry Research Center and Deanship of Scientific Research at King Saud University, Saudi Arabia (Research project # IR 0113).

Conflict of interest

The authors have no conflict of interest to declare.

Other disclosures

None.

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